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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/619,560	07/19/2000	Jane C. Cheng	2000	2046

7590 11/28/2001  
ExxonMobil Chemical Company  
P O Box 2149  
Baytown, TX 77522

EXAMINER

GRIFFIN, WALTER DEAN

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 11/28/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/619,560

Applicant(s)

CHENG ET AL.

Examiner

Walter D. Griffin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 October 2001.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

The objection to claim 9 has been overcome with the deletion of the word "to". The rejection of claim 9 under 35 U.S.C. 112 has been overcome by the substitution of benzene/polyalkylated benzene for alkylatable aromatic compound/polyalkylated aromatic compound.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman (3,385,906) in view of Cheng (5,557,024).

The Kaufman reference generally teaches a process for alkylation followed by transalkylation. Also, the Kaufman reference teaches the reaction of benzene with propylene in the presence of an alkylation catalyst to produce cumene as in column 5 lines 41-43. Furthermore, the Kaufman reference teaches Zeolite Y as a preferred molecular sieve for use in preparing catalysts in column 3, lines 49-50. The Kaufman reference also teaches the liquid phase conditions referred to in claim 11 through the language in column 6 lines 25-26 referring to "benzene and liquefied propylene" and through the conditions referred to in column 5, lines 4-15. Kaufman teaches temperature conditions ranging from 130°C to 250°C, and pressure conditions ranging from 75 p.s.i.g to about 450 p.s.i.g., (5.2 – 31 Bar) with conditions preferably at 95 p.s.i.g. to 145 p.s.i.g. to maintain the liquid phase. See column 5 lines 4-20.

The Kaufman reference does not disclose the mixture of two different molecular sieves as in claim 1 and it does not disclose the process whereby the transalkylation catalyst is produced by coextrusion as described in claim 6. Kaufman also does not teach a weight percentage of the transalkylation catalyst as it relates to the crystalline sieves as in claim 18. Kaufman also does not teach the alkylation catalyst of claim 14.

The Cheng reference teaches the use of MCM-49, MCM-22, zeolite Y, zeolite beta, and mordenite as transalkylation catalysts. It also teaches the use of MCM-56 as an alkylation

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catalyst as in claim 14. See column 1. Furthermore, the reference uses TEA mordenite as a transalkylation catalyst as in claim 4. See column 14. The Cheng reference teaches forming a catalyst by extrusion. See Example 11 and 12, column 21.

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the process of Kaufman by utilizing a combination of any two of the transalkylation catalysts disclosed by Cheng because each of these substances are individually used as transalkylation catalysts. Therefore, the use of a combination of them, in any weight percent including those claimed, to serve as a transalkylation catalyst would be expected to result in effective transalkylation. In re Kerkhoven, 626 F.2d 846, 850 (CCPA 1980).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Kaufman by coextruding the catalyst because Cheng discloses extrusion as a common method for production of a catalyst. Therefore, coextrusion of two or more zeolites would be expected to produce a catalyst.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Kaufman by utilizing MCM-56 alkylation catalyst as disclosed by Cheng because MCM-56 has high activity and selectivity for desired alkylated product.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized TEA-mordenite having a crystal size as claimed because it is an effective transalkylation catalyst as disclosed by Cheng and any crystal size that results in effective contact between the feed and catalyst would be expected to function in the process.

### *Response to Arguments*

The applicant argues that with any showing of *prima facie* obviousness, the showing can be rebutted by evidence of superior results. However, the results in this case are not of a superior nature. The applicant asserts that both mixtures of MCM-22 and mordenite and mixtures of MCM-22 and beta zeolite will result in superior results when used in combination rather than when used separately. However, there are two problems with this argument. Although, the applicant generally claims a mixture of two different molecular sieves (see claim 1), the applicant does not specifically claim the combination of MCM-22 and mordenite and MCM-22 and beta zeolite. Secondly, the MCM-22 and mordenite mixture and the MCM-22 and beta zeolite mixtures do not give way to superior results. The applicant claims that a mixture of MCM-22 and mordenite exhibits a high diisopropylbenzene conversion activity, high cumene selectivity, and low ethylbenzene and n-propylbenzene selectivity; however, there is little difference between the results using MCM-22 and mordenite separately and the results when combining the two. Diisopropylbenzene conversion activity is 50.3% using MCM-22, 52.2% using mordenite and 51.3% combined. Cumene selectivity is 98.5% using MCM-22, 99.2% using mordenite, and 99% combined. Ethylbenzene selectivity is 384 ppm using MCM-22, 124 ppm using mordenite, and 173 ppm combined. N-propylbenzene selectivity is 1056 ppm with MCM-22, 870 ppm with mordenite, and 777 ppm combined.

The applicant also claims that a mixture of MCM-22 and zeolite beta exhibits a high diisopropylbenzene conversion activity, high cumene selectivity, and low ethylbenzene and n-propylbenzene selectivity; however, there is little difference between the results using MCM-22 and zeolite beta separately and the results when combining the two. Diisopropylbenzene

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conversion activity is 50.3% using MCM-22, 49.5% with zeolite beta, and 52.4% combined. Cumene selectivity is 98.5% using MCM-22, 98.2% using zeolite beta, and 98.6% combined. Ethylbenzene selectivity is 384 ppm using MCM-22, 96 ppm using zeolite beta, and 176ppm combined. N-propylbenzene selectivity is 1056 ppm with MCM-22, 766 ppm with zeolite beta, and 644 ppm combined.

### *Conclusion*

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter Griffin whose telephone number is 703-305-3774. The examiner can normally be reached from 6:30-4:00 M-F with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode can be reached on 703-308-4311. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703-305-5408 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

*Walter D. Griffin*

Walter D. Griffin

Primary Examiner

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ja

November 15, 2001